CYTOPHYLETIC ANALYSIS OF HYMENOXYS ODORATA: A RECAPITULATION[1]

B. L. Turner

In a recent article in Madroño, Speese and Baldwin (1963)[2] stated, "The basic number for *H. odorata* is 11. (We assume the report [sic] of n = 15 for this species to be incorrect.)" In spite of this statement, the authors succinctly summarized the reported chromosome counts for *H. odorata* by referring to 3 populational counts from the United States (reported independently by 2 different groups of workers) as being diploid with n = 11; they also referred to chromosome counts by myself from 2 Mexican populations which had n = 15. To convince the reader that the published count of n = 15 for *H. odorata* might be in error, they pointed out that this count (Turner, Beaman & Rock, 1961) was made from "pollen-mother-cell smears of buds fixed in the field during the summer of 1959. Our experience has been that preparations from material so fixed are often difficult to interpret, and especially so if the weather were hot at the time of fixation." This, in spite of the fact that a camera lucida drawing included in the published account showed a meiotic figure with n = 15.

Upon reading Speese and Baldwin's comments, I felt compelled to take a second look. The following account, though phrased in an admittedly personal way, is my version of the story:

When I first received the pickled buds of *H. odorata* from Mexico in 1960, I was reluctant to examine these since I recognized the species as

Table 1. Chromosome Counts of Hymenoxys odorata from Mexico

Collection	Chromosome count		Source
Coahuila: 12 mi S of Saltillo	n = 15		(buds)
Powell & Edmondson 528. TEX		2n = 30	(root tips)
Nuevo Leon: 39 mi S of Saltillo			
Powell & Edmondson 543. TEX		2n = 30	(root tips)
Nuevo Leon: 24 mi S of Galeana			
Crutchfield & Johnston 5860. TEX	n = 15		(buds)
Nuevo Leon: 41.2 mi S of Saltillo			
Rock M264. TEX	n = 15		(buds)
Nuevo Leon: 1 mi S of San Roberto.			
Thompson & Doolin 2163. TEX	n = 15		(buds)

[1] The rhetorical definition of recapitulation is preferred here being "A form of peroration in which the respective processes, as of explanation, conviction, excitation, and persuasion, pursued in a discourse, are concisely repeated for the purpose of more complete effect." (Funk and Wagnalls, New Standard Dictionary, 1945 edition.)

[2] The authors were apparently unaware of an earlier report of n = 15 for *H. anthemoides* from Argentina (Solbrig, 1962).

being one already counted by Speese and Baldwin (1952). However, I thought the single previous count needed checking, so I examined the material and to my surprise it showed n = 15. I double checked this by counting the meiotic material from several different florets and heads; all counts were n = 15. As indicated by Speese and Baldwin in their reference to a *Johnston* collection (*5860*), also from Mexico, I again counted n = 15 for *H. odorata*; this time I was not surprised, but I noted in my lab book and indicated on the collector's label, "n = 15, clearly, det. B. L. Turner from PMC's."

My next encounter with the chromosomes of *H. odorata* came in the fall of 1961 when a graduate research assistant, A. M. Powell, counted n = 15 for a collection of his from Nuevo Leon, Mexico, from the same general area of the previous Mexican collections with n = 15. By this time, *I* was beginning to question the counts of n = 11 reported for *H. odorata* by Speese and Baldwin (1952) as well as those of Raven and Kyhos (1961). My curiosity now being whetted, I collected in the spring of 1962, buds from 3 populations of *H. odorata* (2 in Texas and 1 in California, the latter from the same area from which Raven and Kyhos' counts were obtained). I was delighted to find n = 11 in all these collections (Powell and Turner, 1963); my confidence in my scientific colleagues now re-established I forgot the issue until the recent publication of Speese and Baldwin (1962), statements from which are quoted above.

My first reaction to Baldwin and Speese's comments was mild irritation; this soon gave way to the haunting fear that my observational senses were being affected by the too frequent exposure to acetocarmine fumes, to say nothing of the PDB to which we are all accustomed; finally I couldn't bear the onus of my conscience and decided to germinate seeds from the original Mexican collection or collections to determine if indeed the mitotic counts might not tell a different story, one told from the cool confines of a petri dish instead of the hot atmospheric confinement accorded the original material. In spite of the trivial nature of the "experiment," my excitement was high. I personally transferred the root tips through their various solutions, and by observation time, I was in a fit of fear and hopefulness difficult to imagine by anyone not caught in similar observational disputes.

The mitotic counts proved to be 2n = 30 (Table 1), much as you must have guessed by this time or else I would not have gone to the trouble to write this paper. *Hymenoxys odorata* is obviously dibasic with x = 11 and x = 15 (so far as known). Whether this constitutes cytophylesis in the sense of Baldwin (1939)[3] I leave to the judgment of the reader.

The Plant Research Institute and Department of Botany
University of Texas, Austin

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[3] Baldwin does not define the term cytophyletic in this paper. One can only infer its meaning from a single pertinent sentence as follows: "That the *Crassulaceae* are so chromosomally variable and yet closely related makes a cytophyletic approach to

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A NOTE ON TAXONOMIC CHARACTERS IN LOLIUM

Frank C. Vasek and J. Kirk Ferguson

The introduced grasses, *Lolium perenne L.* and *L. multiflorum Lam.*, are listed in many manuals (e.g. Abrams, 1940; Munz, 1959; Hitchcock, 1950) as two distinct species, separated from each other primarily on the basis of whether the lemma is awned or not. However, in southern California, awned and awnless plants frequently grow in mixed stands. A study was begun to determine whether the presence or absence of an awn is sufficient grounds for distinguishing the two species and to investigate the possibility that other criteria might be more valid. A sample of 50 plants was collected from a mixed population, growing alongside U. S. Highway 60 near the campus of the University of California at Riverside and studied to determine whether characters that distinguish the two species were correlated. In addition, seeds were collected from an awnless plant growing in the Riverside locality and from an awned plant and an awnles plant growing at Zumwalt Meadows, Kings Canyon National Park, California. The latter locality was selected because it is climatically and ecologically greatly different from the former locality. The seeds were planted in the greenhouse and the resulting progenies were studied for character correlation.

According to descriptions found in manuals (Fernald, 1950; Hitchcock, 1950; Munz, 1959) *L. multiflorum* is characterized by awned (at least the upper) lemmas 7 to 8 mm. long, 10 to 20 florets per spikelet, and

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an understanding of the family sound: differences in chromosome number and behavior and morphology allow a recognition of trends, and the trends are fundamental, their divergences and convergences constituting a basic revolutionary pattern; taxonomic categories with names and ranks are conveniences and may or may not have real significance."